

CVS-280

280W SINGLE OUTPUT DC/DC CONVERTERS

GENERAL FEATURES:

Designed according to EN50155:2017 Input voltage according EN50163:2006 Fire and smoke: EN45545-2 pending High input-output isolation 7 kVrms Output ORing diode Input voltage OK LED Output voltage OK LED Overtemperature shutdown



Model	Nominal input voltages	Nominal output voltage
CVS-280-6973	600 / 750 V	24 V
CVS-280-6974	600 / 750 V	36 V
CVS-280-6976	600 / 750 V	72 V
CVS-280-6977	600 / 750 V	110 V

INPUT	
Nominal DC input voltage	600 / 750 V according to EN50163:2006
Minimum DC input voltage	400 V
Maximum DC input voltage	1100 V continuous 3 kV falling to 1.5 kV for 20 ms, 4.5 kV falling to 2.25 kV for 1 ms
Maximum input current	0.84 A
Input consumption at no load	\leq 7 W @ 600 V _{in} , \leq 9 W @ 750 V _{in}
Input undervoltage shutdown	45 % to 55 % Vi nom
OUTPUT	
Output voltage	See previous table
Voltage tolerance	$\leq \pm 1 \%$
Maximum peak current (Iopk) time	500 ms
Total regulation	< ±1 %
Ripple	< 60 mVpp
Ripple + noise (BW 20 MHz)	≤ 1% of nominal output voltage
Maximum continuous power	280 W
Peak power	400 W
ENVIRONMENTAL	
Storage temperature	-40 85 °C
Operating temperature range at Io= 100%	-40 70 °C
Operating temperature range at Io= 62.5%	-40 85 °C
Cooling	Natural convection
Operating altitude	2500 m
Maximum Relative humidity	95 % with no condensation
Shock and vibration	EN61373:2010 Category 1 class B body mounted
Service life	> 20 years
MTBF	200.000 h @ 40 °C according to IEC61709
EMC	
Emission	EN50121-3-2:2016
Immunity	EN50121-3-2:2016
SAFETY	
Safety according to norm	EN50124-1:2016 Railway app. (Insulation coordination)
Dielectric strength Input / Output	7000 Vac 50 Hz 10 s
Dielectric strength Input / Earth	5300 Vac 50 Hz 10 s
Dielectric strength Output / Earth	1800 Vac 50 Hz 1 min
Protection Degree	IP20
Fire and smoke	EN45545-2:2013 +A1:2015
MECHANICAL	
Dimensions	65 x 162 x 230 mm
Weight	1750 g
CONTROL	
Low output voltage alarm	Threshold: 0.9 0.95 Vo nom. Isolated solid state relay open when alarm. Maximum rating contact capacity 100 mA and 160 V (closed < 8 Ω)
Remote inhibit input	Inhibit voltage range: Nominal Output Voltage \pm 40 %
PROTECTIONS	Innole voltage range, Normilal Output voltage ± 40 %
Against output overloads and short-circuits	Current limiting
Against output overloads and short-circuits Against reverse input voltage	By input diode in serial connection.
Against reverse input voltage	Under-voltage lock-out. See Note 2
Against Input over-currents	Input fuse
Against Overtemperature	Shutdown when internal temperature rises 120 °C
Others	PCB conformal coated with acrylic varnish

Note-1: The unit can start up and work at an ambient temperature of -40°C with the following restrictions:

• Do not handle the connection terminals below -25°C

• The output ripple can rise up to 240mVpp at -40°C

Note-2: In case of lock-out, a pulse of inhibit signal is needed to reset the converter (minimum 100ms); or remove the input supply voltage for at least 3 seconds.

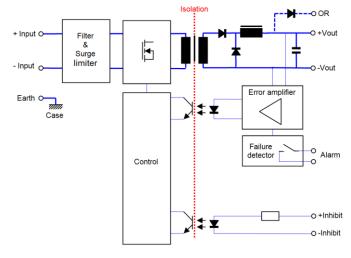


ORDERING CODES

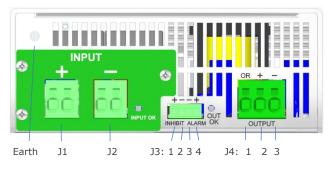
Model	Nominal Input Voltages [V]	Input Voltage Range [V]	Nominal Output Voltage [V]	Max Output Current [V]	Max Output Power [W]	Output Peak Current [A]	Output Peak Power [W]	Efficiency @750V _{in} [%]
CVS-280-6973	600 / 750	400 - 1100	24	11.6	280	16.6	400	88
CVS-280-6974	600 / 750	400 - 1100	36	7.7	280	11.1	400	88
CVS-280-6976	600 / 750	400 - 1100	72	3.8	280	5.67	400	89
CVS-280-6977	600 / 750	400 - 1100	110	2.5	280	3.64	400	89.5

Accessories must be ordered in a separate order line

BLOCKS DIAGRAM



CONNECTIONS



<u>Note 1</u>: maximum spring terminals cross section cable $6mm^2$ or 10 mm² for solid

Note 2: J3 recommended female connector Phoenix Contact FMC 1,5/4-ST-3.81 or MC 1,5/4-ST-3,81

Note 3: maximum nut torque in M5 earth connection 1.9 Nm

DESCRIPTION

The CVS-280 series consists of DC/DC converters, with a galvanic isolation between input and output, operating at fixed switching frequency.

It includes an output ORing diode which allows redundancy. It also allows paralleling with a battery.

The device is protected against overload and short-circuits by means of a current limiting circuit.

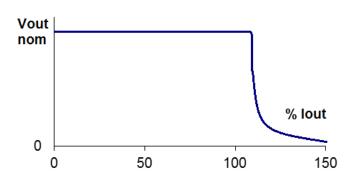
The device is also protected against reverse polarity input voltage by means of an input diode in series with the input line.

When an input undervoltage condition occurs, the converter is disabled, thus preventing an improper output voltage.

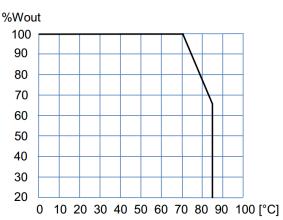
The failure output voltage detector circuit close the contact (NO) when the output voltage is higher than 90..95 % of the nominal output voltage.

	Function
Earth	M5 male earth connection
J1	Positive input clamp terminal (x2)
J2	Negative input clamp terminal (x2)
J3-1	Positive input inhibit signal
J3-2	Negative input inhibit signal
J3-3	Alarm output state contact 1
J3-4	Alarm output state contact 2
J4-1	Positive output clamp terminal by Oring
J4-2	Positive output clamp terminal
J4-3	Negative output clamp terminal

TYPICAL OUTPUT CHARACTERISTIC

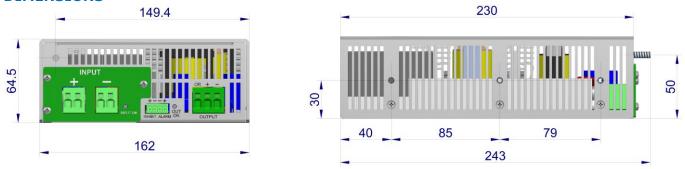


POWER DERATING vs AMBIENT TEMP.





DIMENSIONS

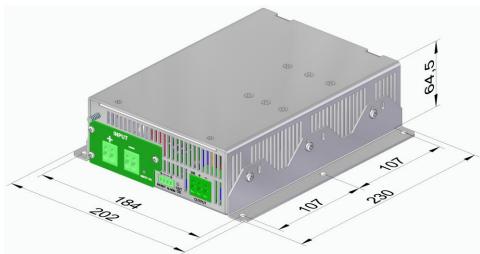


Lateral fixing holes 6 x M4 (screw torque < 1.6 Nm). Maximum screw deep 6 mm.

ACCESSORIES

DESCRIPTION	NOTES	CODE
Mounting brackets kit	Contains two brackets and screws	NP-9435







(EU DECLARATION OF CONFORMITY

The undersigned, representing the following:

Manufacturer:	PREMIUM, S. A.,
Address:	C/ Dolors Aleu 19-21, 08908 L'Hospitalet de Llobregat, SPAIN

herewith declares that the product:

Туре:	DC/DC converter
Models:	CVS-280-6973 6977

is in conformity with the provisions of the following EU directive(s):

2014/35/EU	Low voltage
2014/30/EU	Electromagnetic compatibility
2011/65/EU	Restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)

and that standards and/or technical specifications referenced overleaf have been applied:

EN 60950-1: 2005	Safety. Information technology equipment
EN 62368-1: 2014	Safety. Audio/video, information and communication technology equipment
EN 61000-6-3: 2007	Generic emission standard
EN 61000-6-2: 2005	Generic immunity standard
EN 50155: 2017*	Railway applications. Electronic equipment used on rolling stock material
EN 50121-3-2: 2016*	Railway applications. EMC Rolling stock equipment
EN 50121-4: 2016*	Railway applications. EMC of the signalling and telecommunications apparatus

* See annexe

CE marking year: 2020

Notes:

For the fulfillment of this declaration the product must be used only for the aim that has been conceived, considering the limitations established in the instructions manual or datasheet.

L'Hospitalet de Llobregat, 15-05-2020

Jordi Gazo Chief Executive Officer

PREMIUM S.A. is an ISO9001and ISO14001 certified company by **Bureau Veritas**

ANNEXE

4.0.4	••	e values for the dif	Terenit sec	LIOIIS	of the norm	II EN30135. 20	017			
4.3.1	Working altitude		Up to 2500m							
4.3.2	Ambient temperature	Class OT4: load < 100% Class OT6: load < 62.5%								
4.3.3	Switch-on extended operating temp.	Class ST1, ST2								
4.3.4	Rapid temperature variations	Class H1								
4.3.5	Shocks and vibrations	According EN61373:2010 Category 1 class B								
		Test Norm		m	n Port Freque		ncy Limits			
						30MHz2	30MHz	40dB(μV/m) Qpk at 10m		
		Radiated	IEC550	F04 (Care		230MHz	.1GHz	47dB(μV/m) Qpk at 10m		
		emissions	IECSS	010	Case	13G	Hz	Do not apply		
						36G	Hz	Internal freq. < 108MHz		
		Conducted	IEC550	016	Output	150kHz5	500kHz	99dB(μV) Qpk		
		emissions	ILCOS	010	Output	500kHz30MHz		93dB(μV) Qpk		
		Test			Norm	Port	Severity	Conditions	Р	
		Electrostatic o	discharge	IECé	51000-4-2	Case	±8kV	Air (isolated parts)	В	
			0				±8kV	Contact (conductive parts)		
							20V/m	0.081.0GHz M. 80% 1kHz		
	EMC Electromagnetic Compatibility	Radiate		IECé	51000-4-3	X/Y/Z Axis	10V/m	1.42.1GHz M. 80% 1kHz	A	
4.3.6	EN50121-3-2:2015	high-frequ	lency				5V/m	2.12.5GHz M. 80% 1kHz		
	EN50121-3-2:2015					Innersk	3V/m	5.16Ghz M. 80% 1kHz		
						Input	±2kV			
		Fast trans	Fast transients		51000-4-4	Output	±2kV ±2kV	Tr/Th: 5/50 ns	А	
						Signal P	±2kv ±1kV			
						Input L to L	±1kV ±1kV			
		Surge			51000-4-5	Input L to L Input L to P	±2kV	Tr/Th: 1.2/50μs	В	
		Input					10V			
		Out			Output	10V				
		Conducte	ed RF	IEC61000-4-6		Signal	10V	0.1580MHz M. 80% 1kHz	A	
						P	10V			
		Magnetic	field	IECé	51000-4-8	X/Y/Z Axis	300A/m	0Hz, 16.7Hz, 50/60Hz	А	
		Pulse magne	tic field	IECé	51000-4-9	X/Y/Z Axis	300A/m	Tr/Th: 6.4/16µs	В	
		Performance criteria, L= Line, P= PE (Protective Earth)								
4.3.7	Relative humidity	Up to 95%								
5.1.1.2	DC power supply range	From 0.70 to 1.2	25 Un con	tinuou	s					
5.1.1.3	Temporary DC power supply	From 0.60 to 1.4	0 Un 0.1s	5						
5.1.1.3	fluctuation	From 1.25 to 1.4	0 Un 1s v	vithou	t damage					
5.1.1.4	Interruptions of voltage supply	Class S2 (10ms)								
5.1.1.6	Input ripple factor	10% peak to pea								
5.1.3	Supply change-over	0,6 Un duration			interruptio	ons). Performa	nce criteric	on A		
7.2.7	Input reverse polarity protection	By serial diode in	n the inpu	t						
10.7	Protective coating for PCB assemblies	Class PC2	_							
		1 Visual Inspec					Routine			
		2 Performance					Routine			
		3 Power supply					Routine			
		4 Insulation tes				Routine				
		5 Low temperature storage test 6 Low temperature start-up test					- Type			
		6 Low temperature start-up test 7 Dry heat test								
13.3	Tests list	7 Dry heat test 8 Cyclic damp heat test					Туре			
		9 Salt mist test					Туре			
		9 Salt mist test 10 Enclosure protection test (IP con 11 EMC test			code)		_			
								Туре		
		12 Shocks and vibrations test					Туре			
		13 Equipment st				Routine: 24h at 40°C and load 100%				
		14 Rapid Tempe	raturo var	iation	test	Туре				